

## **REMARKS**

Reconsideration of the present application is respectfully requested.

The Applicants thank the Examiner for reviewing the multiple species and subspecies election requirements and confirming that claims 1-11 and 30 are presently being examined. In making the species election the Applicants elected the species of Figure 6 that has a partially exploded view set forth in Figure 7. Further, the Applicants provided in a prior response that the space time (wave) diagram is set forth in at least Figure 8 for the elected species.

The abstract has been amended to address the concerns raised in the Office Action. Withdrawal of the objection to the abstract is respectfully requested.

In paragraph 3, of the Office Action, the Examiner objected to the specification because of the following teachings that lack credibility:

A) on p. 10, ll 15-16 state that nitrogen, carbon dioxide, and helium are contemplated as the working fluid ; it is not clear how these gases could oxidize fuel.

B) on p.10, the bottom line states that the invention is contemplated to be used with a pulsed deflagration combustion process; it is not clear how such a process can make the disclosed apparatus operational. A detailed explanation is required.

C) on p. 11, l. 4 states that an aircraft powered by the invention can be an unmanned space device; it is not clear how the disclosed power plan can operate in vacuum.

D) On p. 14, the bottom line states that the present invention contemplates rotational speeds up to 100,000 revolutions per minute, that are in excess of 1,600 revolutions per second. In addition, on the next page a further statement indicates, 'the present invention is not intended to be limited to these rotational speeds.' Applicants is required to submit evidence that the invention has been operated at such speeds, or that any contemplated design may come close to indicate that such operational speeds, or higher are feasible at all. It is believed that centrifugal forces would rip the invention apart at speeds very much lower than said speeds. A detailed explanation is required.

E) On p. 28, ll 11-12 state that 'The admission of gas via port 222 can be accomplished by a shock wave.' This teaching is completely unclear.

May 31, 2005 Office Action p. 2, l. 20 – p. 3, l. 14.

In order to respond to this objection there was required some consideration of the Examiner's statement that the "teachings lack credibility." Upon consultation of Webster's New Collegiate dictionary one might conclude that this phrase meant the Applicants' teaching were not worthy of belief. However, the Applicants are operating under the assumption that this is not the intended meaning, and rather the Examiner is asking for clarification by the Applicants. A declaration of one of the inventors, Dr. Philip H. Snyder is provided herewith to address the objections set forth in paragraph 3 of the Office Action.

Dr. Philip H. Snyder, the declarant, is employed by Rolls-Royce Corporation as a Propulsion System Integration Technical Specialist. In addition to his formal education and professional work experience Dr. Snyder has been recognized as a Rolls-Royce Associate Fellow for Aerothermal Systems. Further, Dr. Snyder is an inventor on a number of United States Patents. The enclosed declaration speaks for itself and is believed to address the issues raised by the Examiner regarding the specification. Withdrawal of the objection to the specification is respectfully requested.

In paragraph 5 of the Office Action the Examiner rejected claims 1-11 under 35 U.S.C. § 112, first paragraph as failing to comply with the enablement requirement. More specifically, the Examiner writes that "[t]he claim(s) contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention." Office Action dated May 31, 2005, p. 3, l. 22- p. 4, l. 2. In responding to this rejection the Applicants have amended claims 1, 2 and provided the Declaration of Dr.

Snyder. The Applicants respectfully traverse the § 112, first paragraph rejection of claims 1-11.

The last clause of claims 1 has been amended to read as as follows: a fuel deliverer adapted to deliver a fuel within said buffer gas ~~exit~~ inlet port adjacent the rotatable rotor, wherein said fuel deliverer delivers fuel into a first portion of said buffer gas ~~exit~~ inlet port and not into a second portion of said buffer gas ~~exit~~ inlet port. Further, claim 2 has been amended to read as follows: wherein said second portion includes a leading portion of said buffer gas ~~exit~~ inlet port. Before, addressing the specifics on page 4 of the Office Action, the Applicants wish to address the Examiners apparent position on required drawings and space-time (wave) diagrams. Dr. Snyder addresses these issues in section 8, in the attached declaration.

Dr. Snyder sets out quite clearly in his declaration that space-time (wave) diagrams are the appropriate means to inform those skilled in the art of pressure wave apparatus about the present invention. Dr. Snyder in his declaration instructs that a space-time (wave) diagram is an unrolled view of the ports and passages of the device. Dr. Snyder further addresses the Examiner's requiring the Applicants to amend Figure 7 to include all of the numerals listed in the first paragraph of page 27. The Applicants' respectfully disagree with the Examiner about the requirement to amend Figure 7. In support of their opposition to this requirement the declaration of Dr. Snyder provides that in his opinion the Examiner's proposed amendment is not practical and would result in creating confusion to a reader skilled in the art.

The Examiner writes that "[t]he last paragraph of claim 1 that claims 'a fuel deliverer adapted to deliver a fuel within said buffer exit port adjacent the rotatable rotor,

wherein said fuel deliverer delivers fuel into a first portion of said buffer gas exit port and not into a second portion of said buffer gas exit port' is not enabled, and furthermore could not even be understood in light of the disclosure." Office Action dated May 31, 2005, p. 4, ll 5-9. As discussed above claim 1 has been amended to clarify that the portions are in relation to the buffer gas inlet port. The Applicants firmly believe that the original specification is quite enabling to one of ordinary skill in the art. With reference to FIGS. 8 and 12 and the supporting text the Applicants will provide clarification regarding the rejections.

With reference to Fig. 12, and the supporting text in the application there is provided that the "changing of the fueling at the region just prior to the high pressure energy gas inlet port 222 is utilized to adjust the exit temperature of the fluid from the pulsed detonation engine wave rotor." '290 specification, p. 33, ll. 21-23. The specification further discloses "[a] plurality of fuel delivery devices 400 is located across the duct 222 prior to the high pressure energy transfer gas inlet port 222." '290 specification, p. 34, ll 2-4. The fuel delivery devices are active devices that can be controlled to selectively deliver fuel into the duct 222a. Further, the application provides that "[i]n one form of the present invention, a leading first unfueled portion 401 of the high pressure energy transfer gas inlet port is left unfueled." '290 specification, p. 34, ll. 10-11. The Examiner is respectfully requested to review the above language in concert with at least pages 33-35 and Fig. 12 of the application. Applicants respectfully request withdrawal of the above enablement rejection as the application is believed enabled to one of ordinary skill in the art.

The Examiner writes that the teachings of said first paragraph on p. 27 are not enabled, e.g., supply tubes (gas) 227” located within the rotor.” Office Action dated May 31, 2005, p. 4, ll 13-15. Upon review of the first paragraph of p. 27 it is believed that the complete language should be “supply tubes (gas) “227 located within the rotor end plate 226.” ‘290 specification, p. 27, l. 8. The law is settled that the invention that must be enabled is the claimed invention and not aspects of the invention for which patent protection is not being pursued. Upon review of the pending claims it is respectfully argued that they are enabled so that one skilled in the art can use the invention. Further, the Examiner’s concern over “ 227 is not clearly understood by the Applicants and if the rejection is to stand the Examiner is respectfully requested to provide further details regarding this asserted enablement rejection.

The Examiner writes that “[r]egarding claims 2 and 9-11, the location and shape of the leading portion of the buffer gas exit port are not enabled.” Office Action dated May 31, 2005, p. 4, ll 16-17. The Application provides that in Fig. 12 there is depicted the “leading first unfueled portion 401 of the high pressure energy transfer gas inlet port 222. ‘290 specification, p. 34, ll. 10-11. Withdrawal of the above enablement rejection of claims 2 and 9-11 is respectfully requested.

The Examiner writes that “[r]egarding claim 3, it is not enabled where the ‘initial about fifteen percent of said buffer gas inlet port’ are measured from. Note that it is practically impossible to determine these limitations from Fig. 7.” Office Action dated May 31, 2005, p. 4, ll 17 - 19. The Application provides that in FIG. 12 the leading portion is represented by feature number 401. ‘290 specification, p. 34, ll. 10-11. The Application further provides that the “leading first unfueled portion 401 is within a range

of about two to about seventy-five percent of the inlet port 222, and in a preferred form is about 15 percent of the inlet port 222 and the rest of the port is fueled.” ‘290 specification, p. 34, ll. 11-13. Applicants respectfully urge that it is clear where the leading portion of the buffer gas inlet portion is located and one of skill in the art will surely be able to determine what fifteen percent of the buffer gas inlet port comprises. Withdrawal of the above enablement rejection of claim 3 is respectfully requested.

The Examiner writes that “[r]egarding claims 4-5, the location and shape of the leading and last portions of the buffer gas inlet port are not enabled.” Office Action dated May 31, 2005, p. 4, ll. 19 - 21. The Applicants provide that in Fig. 12 there is depicted a last unfueled portion 402 of the high pressure energy transfer gas inlet port 222. ‘290 specification, p. 34, ll. 14-15. The specification further provides that “a preferred form of the present application includes a first (leading) unfueled portion 401 and a second (last) unfueled portion 402, and preferably the first (leading) unfueled portion is about 15 percent and the second (last) unfueled portion is about 10 percent. ‘290 specification, p. 34, ll. 18-20. The Applicants respectfully urge that the text and drawing of the application clearly provide an enabling disclosure for claims 4 and 5. Withdrawal of the above enablement rejection of claims 4 and 5 is respectfully requested.

The Examiner writes that “[r]egarding claims 6 and 9-11, the plurality of fuel delivery devices spaced across the buffer gas inlet port are not enabled. Office Action dated May 31, 2005, p. 4, l. 21 – p.5, l. 1. The Applicants provide that in Fig. 12 there is depicted a fuel delivery system including fuel delivery devices 400a, 400b, 400c. ‘290 specification, p. 34, ll. 5-7. In one form the fuel delivery devices are active elements

that can be controlled to selectively deliver fuel. '290 specification, p. 34, ll. 4-5. The Applicants respectfully urge that the text and drawing of the application clearly provide an enabling disclosure for claims 4 and 5. Withdrawal of the above enablement rejection of claims 6 and 9-11 is respectfully requested.

The Examiner writes that "[r]egarding claim 7, the claimed passageway is not enabled. Office Action dated May 31, 2005, p. 2. With reference to Fig. 12, there is illustrated the passageway for fluid flow between the buffer gas exit port 224 and the buffer gas inlet port 222. Further, the passageway is depicted as having fluid flow in the direction of rotation as indicated by arrow Q. Withdrawal of the above enablement rejection of claim 7 is respectfully requested.

Claims 1-11 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. "This rejection is related to the previous rejection under 35 U.S.C. § 112, 1<sup>st</sup> paragraph. It is not clear which are the claimed first and second portions of said buffer gas exit port. Upon review of the above remarks related to the enablement rejections of the claims 1-11, the Applicants trust that there is clarification about the first and second portions of the buffer gas inlet port. With reference to Fig. 12, there is illustrated the buffer gas inlet port 222. The text of the application defines different portions of the buffer gas inlet port, such as portions 401, 402 and the portion disposed therebetween. The buffer gas inlet port is considered the whole, and the fuel deliverer delivers fuel into a first portion of the whole and not into another portion of the whole. Withdrawal of the § 112 (2) rejection is respectfully requested.

Claims 1 and 30 have been rejected under the judicially created doctrine of obvious-type double patenting in view of United States Patent No. 6,444,939 to Snyder. In making the rejection the Examiner utilizes claim 41 of the '939 patent to reject claim 1 in the pending application and claim 7 of the '939 patent to reject claim 30 of the pending application. The Office Action does not provide any obviousness-type double patenting rejections of claims 2- 11. More specifically, the rejection reads that

[a]lthough the conflicting claims are not identical, they are not patentably distinct from each other because to the extent the last paragraph of claim 1 could be understood, it reads on the limitations of dependent claim 41 and base claim 38. Further, claim 30 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 7 of U.S. Patent No. 6,449,939. Although the conflicting claims are not identical, they are not patentability distinct from each other because claim 7 claims providing a turbine to base claim 1, and it would have been obvious (if not inherent) to one of ordinary skill in the art at the time of the claimed invention that a fluid flowing through the turbine expands in the process of energy extraction by the turbine.

Office Action dated May 31, 2005, p. 6, ll 6 - 16.

The law is well settled that the obviousness-type double patenting analysis in the present situation is a one way test to determine whether any variations between the inventions claimed in the claims of the present application and in the claims of the earlier patent would have been obvious to a person of ordinary skill in the art. The analysis should not focus on what the claim language discloses, but rather on what it defines.

The present Office Action provided that the last paragraph of claim 1 could not be very well understood by the Examiner. Therefore, the analysis for the obvious-type double patenting rejection is respectfully believed to be premature because the focus in this analysis should be on the invention defined. The Applicants have amended claim 1

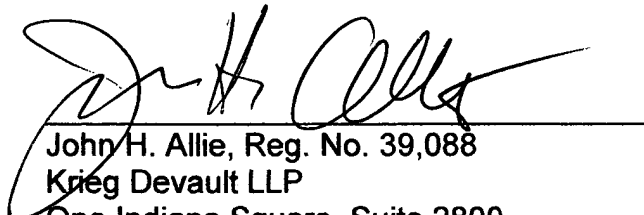


to address the issues raised by the Examiner in the previous portions of this Office Action and believe that the last paragraph should be better understood.

Applicants respectfully request that the obviousness type double patenting rejection of claims 1 and 30 be reconsidered by the Examiner in light of the above remarks and amendments to claim 1. Further, claims 2-11 were not subject to any obviousness type double patenting rejection.

Applicants respectfully request further consideration and the passage of the application to allowance.

Respectfully Submitted,



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